

# **The Stone Quarrying Industry around Delhi – Impact on Workers and the Environment**

**S.A. Azad**

**Dr. Ashish Mittal**

**PRASAR**

**2006**

## Background

Delhi, the capital city of India is among the oldest historical living cities of the world with around 20,000 archeological remnants and ruins. The earliest reference to Delhi belongs Buddhist and Jain scriptures and as Indraprastha of Mahabharat. The next mention of the city is during the rule of the King Anangpal who built his fort near the present day Qutab Minar.



Thereafter, Delhi had been built by different rulers in geographical parts with erecting monuments at different locations. In 1303 Khilji built his capital at Siri fort thereby constructing Delhi's second city. During the Tughlak rule (1320-1412) the third and fourth cities of Delhi were founded. Sultan Mohammad-bin-Tughlak constructed Delhi's fourth city called Jahanpanah close to the present day Qutab Minar. Founded by Firoz Shah Tughlaq (1351-88) Delhi's fifth city was named Ferozabad and was located in the vicinity of the present day Feroz Shah Kotla fort. Constructed in an area said to be the ancient city of Indraprastha, Purana Quila was erected by the Mughal Emperor Humayun between 1533-34. Shahjahanabad or old Delhi as it is now called, was build by Emperor Shah Jahan as Delhi's seventh city between 1638 and 1649. This city comprises of the famous Red Fort, Jama Masjid and contains many fine examples of Mughal architecture.

All the while as rulers built and un-built these seven cities, there was an emphasis on forts, palatial mansions, and mosques. The period of conquests and the employment of artillery sent old forts crumbling down and walls getting razed to the ground. But soon after the victory, every ruler had to pay attention to the need of creating walled city to prevent his/her subjects from outside invasion. Those structures invariably involved a huge amount of stones to be stocked and piled up. Masonry developed in great details during these times and forts demanded a continuous workforce of sculptors who gave shapes to stones for posterity. Stones of special size for sculptures and forts had to be sourced by

employing a huge workforce of miners. This impacted the mountain range of Aravalli a great deal and mountain landscape underwent a significant change.

The Aravalli range is a range of mountains in western India running approximately 300 miles (560 kms) northeast and southwest across the State of Rajasthan. The northern end of the range continues as isolated hills and rocky ridges into state of Haryana, and ends in Delhi. Divided into the Sambhar-Sirohi and the Sambhar-Khetri ranges, the hills contain a variety of minerals, including large amounts of quartzite. Most of the hills are 2000 to 3000 feet (300 to 400 meters) in altitude and from 6 to 60 miles (10 to 100 kms) in width.

Why was the geographical location of Delhi an attraction for rulers to build their capital cities down the history lane? Probably hills provided an easy access to mine stones for construction, Yamuna blessed the population with the water and the Yamuna – Ganga doab provided the fertile land for agricultural activities. During colonial times, Britishers also choose this region for shifting the capital of imperial India from Calcutta to Delhi in 1911. Two British architects, Sir Edwin Lutyens and Sir Herbert Baker were commissioned to design a city in keeping with the grandeur of India.

Lutyens started planning buildings, roads and market areas. The Meo community (Mewad) inhabiting the villages was relocated to Faridabad, Gurgaon, Sonapat and other adjoining areas. The remnants of those villages can be easily seen as the old mosques that Lutyen allowed staying in their original places.

However, the same fate couldn't be that of hills like Raisina and others. Lutyens needed stones and these hills had to be razed down to make the road for imperial buildings like, Viceroy's House, Parliament of India and Connought Place and others. People staying around and outside the Walled City – formerly known as Shahjahanabad were relocated to Rahegarpura and Karol Bagh. During 1911 to 1940, many hills were flattened and many spaces were carved out that went into making the New Delhi and the colonial capital city was formally inaugurated in 1931.

During the two World Wars and particularly since the Second World War, construction was negligible. In the year 1947, India became independent nation and the new construction was planned and in '50s mining started in and around Anand Parvat (near the present New Delhi Railway Station). Now, there was an interesting motive behind mining and razing down the hills. The administration and builders started the phenomenon of "mine, raze and grab", whereby grabbing the flattened land after the razing of hills. The community of mining workers consisted mainly people coming from Rajasthani dalit (SC/ST) communities. Once Anand Parvat land grab was total; they moved to Timarpur and Chandraval villages (near the present day Inter State Bus Terminal and Kashmere Gate) and started the work there. This continued till '70s. Once the land grab here was total, the community working in stone quarries moved towards Dhaula Kuan. However

they were moved again from Dhaula Kuan following the total hold of builders and administration, they decided to settle down on area stretching from Tajpur, Badarpur, Lalkuan, Lakadpur, Anangpur, Surajkund, Kusum Pahadi, Rajokri and Bhati Mines.

In the decade of 80s there was pressure of ASIAD (Asian Games) and it led to rampant mining activities, as new auditoriums, stadiums, flyovers, roads and other constructions were to be constructed. It is around this period that new mining and stone quarry and crusher workers started coming in Delhi from places other than Rajasthan as well (from Bihar, Madhya Pradesh and Eastern Uttar Pradesh).

In 1960s there was need to introduce the legislation as the incidents of occupational health hazards had come to the light, with workers complaining about chronic diseases and deaths with a short lifespan. To put the stone quarrying under some sort of administration, legislation was formed. Under the Delhi Minor Minerals Rules (1962), framed under the Mines and Minerals (Regulation and Development act, 1957), the Collector of Mines grants permits to mine the minerals in the Union Territory of Delhi. The Lt. Governor holds the administrative powers for this purpose. The Directorate-General of Mines Safety (DGMS) under the Union Ministry of Labour, is responsible for enforcement of the laws for safety and welfare of the workers. According to the above mentioned Rules no person except the holder of the permit can mine the minerals.

Towards late eighties and early nineties, the phenomenon of “mine, raze and grab” was replaced by the campaign “right to clean air.” Initially, what was an the automatic phenomenon of shifting the quarry and crushing sites as the land grab was over in the area, now the relocation of all the mining activities was under the veil of preventing the pollution and environmental protection. In 1992, came a Supreme Court judgment, which ordered all stone crushers, stone mining operating in Delhi to move out of the metropolis. The builders grabbed the land that was vacated when the polluting crushers and mining got relocated and many hotels and high-rise buildings came up on it.

The mining and crushing units from Delhi were shifted to Pali, Mohabatabad and Sirohi area in the adjoining state of Haryana. It being apparent that the basis for closing down the crushers was the deterioration of the quality of the environment to the extent of it being a health hazard to the residents of the area. The universal appeal of this principle hold true irrespective of the geographical area, race, religion, socioeconomic status, demographic characteristics of the population and as well as the time frame whatsoever it may be applied to.

In order to observe the implementation of the above principle, the following survey was carried out in the Pali area. The intention was to observe the impact of rehabilitation of the quarry / crushing units and developments thereafter on the environment of the Village Pali.

## **Survey Report**

The quarrying / mining operations are done at Rocky Mountains with the help of blasting. This is a manual operation where by holes are drilled in the rocks to place the dynamite. Blasting converts huge rocks into different size of stones, which are loaded to the trucks or dumpers and are then carried to the stone crushers. The final products after crushing includes: stones of different sizes and sand of different particle sizes, which are used as raw material for building and construction material.

The lease for carrying the mining / quarry is given by the State Government to the leaseholder who, in turn carries out all the operations for the specific period of lease holding. All the operations of mining and crushing are to be done under the prescribed norms of Ministry of Environment and Forests (MoEF), Govt. of India. The other departments responsible for the above operations are: Ministry of Mining, respective State Ministries of Mining / Forests, Central Pollution Control Board / State Pollution Control Boards, Ministry of Industry, Ministry of Urban Planning and Development, Labour Department, and Local administrative bodies.

The Delhi Factories Rules 1950, under the Schedule XXVI describes manipulation of Stone or Any Other Materials Containing Free Silica. It provides that this Schedule shall apply to all factories or parts of factories in which manipulation of stone or any other material containing free silica is carried on. For the purpose of this Schedule, Manipulation means crushing, breaking, chipping, dressing, grinding, sieving, mixing, grading or handling of stone or any other material containing free silica or any other operation involving such stone or material. It further prescribes that no manipulation shall be carried out in a factory or part of a factory unless one or more of the following measures, namely: - a) damping the stone or other material being processed; b) providing water spray; c) enclosing the process; d) isolating the process; and e) providing localized exhaust ventilation are in place.

Both the operations of quarrying and crushing being a hazard to environment as well as to human beings, they require continuous monitoring of the workplace as well as the workers. Mining operations cause deforestation, loss of vegetation, soil erosion, ground water level changes and pollution, which can lead to an ecological imbalance.

## **Occupational Health Hazards**

For years, stone quarrying and crushing has been known as a highly hazardous work, whereby workers are affected by many debilitating occupational health hazards and diseases. Mostly the migrant workers are engaged in this highly unorganized industry. The most common exposure is from silica dust, which causes Silicosis (a type of Occupational Lung Disease known by a common name of Pneumoconiosis) among the exposed workers

Silicosis is a disabling, nonreversible and sometimes fatal lung disease caused by overexposure to respirable crystalline silica. Silica is the second most common mineral in the earth's crust and is a major component of sand, rock, and mineral ores. Overexposure to dust that contains microscopic particles of crystalline silica can cause scar tissue to form in the lungs, which reduces the lungs' ability to extract oxygen from the air. In addition to silicosis, inhalation of crystalline silica particles has been associated with other diseases, such as bronchitis and tuberculosis. Some studies also indicate an association with lung cancer. There is no cure for the disease, but it is 100 percent preventable if employers, workers, and health professionals work together to reduce exposures.

There are two types of silicosis, depending upon the airborne concentration of crystalline silica to which a worker has been exposed:

- *Chronic silicosis* usually occurs after 10 or more years of overexposure. *Accelerated silicosis* results from higher exposures and develops over 5-10 years.
- *Acute silicosis* occurs where exposures are the highest and can cause symptoms to develop within a few weeks or up to 5 years.

Removal of the source of silica exposure is important to prevent further worsening of the disease.

The other health hazards could be due to noise pollution, heavy manual labour, minor / major injuries and accidents at workplace, and long working hours. Lack of basic sanitation facilities, drinking water, and shelter add to aggravation of the bad working conditions. Malnourishment, lowered immunity, smoking and alcoholism are common among these workers.

## **Historical Background**

**Pali:** The silent existence of this village situated in the foothills of Arvalli was shattered by a thunderstorm in the early nineties. This was the Judgment of The Honorable Supreme Court in the PIL Case No. WP 4677/1985, (1992.05.15) between M. C. Mehta Vs. Union Of India (Delhi Land Case: Stone Crushers). In the Judgment of above said case, The Honorable Supreme Court has observed, *"We are conscious that environmental changes are the inevitable consequence of industrial development in our country, but at the same time the quality of environment cannot be permitted to be damaged by polluting the air, water and*

*land to such an extent that it becomes a health hazard for the residents of the area*". And thereby ordered the closure of all the mechanical stone crushers established/operating in Lal Kuan, Anand Parbat, Rajokri, Tughlakabad and in any other area of the Union territory of Delhi with effect from August 15, 1992. Further, the mechanical stone crushers, established/operating in Suraj Kund, Lakhanpur, Lakkarpur, Kattan, Gurukul, Badkhal, Pallinangla, Saraikhaja, Anangpur and Ballabgarh areas of Haryana also shall stop operating/functioning with effect from August 15, 1992. And thus no stone crusher shall operate in the above-said area from August 15, 1992 onward.

And as a consequence of the above order and to rehabilitate the above units, the Apex Court had approved a new "Crushing Zone" at the village Pali, Distt. Faridabad, Haryana on the recommendations of The Town and Country Planning Department, Government of Haryana, and the lay-out Plan has been prepared and is in the process of demarcation by the Haryana Urban Development Authority.

### **Pali – The Crushing Zone**

Village Pali is located at approximately 20 Km from Delhi – Faridabad border (Badarpur Border) in the foothills of Aravali in Distt. Faridabad, State of Haryana. The zone having another village by the name of Mohabtabad is collectively known as Pali – Mohabtabad crusher zone area. There are around 1000 homes in Pali and around 600 in Mohabatabad and a population of nearly 7-8000 living in both the villages. The main community inhabiting the area belongs to "Gujjars" who used to earn their livelihood from the animal husbandry. The area was self-dependent and people used to carry on farming and keep animals to earn their basic needs of food and shelter.

After the introduction of mining and establishment of crushers in the vicinity of the village in 1992, the natives were lured into the business by the handsome returns and a regular employment. Most of them sold away their land and animals to purchase the trucks and dampers. The rest of the money was taken on as loans from banks or private financiers.

Mining, which started in the area in 1992-93, went on till 2001-2002. For the last two and half year the quarrying has been stopped by a Supreme Court Order. However approximately 250 operational crushing units of the Pali – Mohabtabad area are getting their raw material from nearby areas of villages Sirohi and Khori. Approximately 5-6000 migrant laborers are working on these crushers. Another 12-15000 workers are engaged in loading / unloading, truck / dumper driving and associated activities.

### **Methods and Materials**

The relevant literature, the judgments of the Supreme Court and the prescribed norms for the establishment / operations of the crusher / mining were collected from the Internet, Dept. of Mining, State Pollution Control Board as well as the manufactures of the crushing machinery.

Visits to the place were made by road and observations made. Questionnaire based interviews were taken from few randomly selected people from the village and a few workers from the crushers. Relevant photographs were taken from the places of interest and are included in the report.

In the above said background, it was imperative to narrate the environment of village, the crushers and the quarry along with impact of these activities on the health of workers and the villagers.

The term environment implies all the external factors – living and non-living, material and non-material, which surround human beings. The basic three component of the environment are:

- Physical environment consisting of water, soil, air, housing etc.
- Biological environment includes plant and animal life.
- Social environment includes customs, culture, habits, income, occupation etc.

Thus a balance between these three will make the environment a healthy one. However to make the things more discrete and clear, the village environment and the crushing zone environment is discussed separately.

### **The Village Environment:**

The village surrounded by the Aravalli Hills on one side has sparsely located houses. A small village, with 1/4<sup>th</sup> of the land in the plain has 3/4<sup>th</sup> inheritance in the mountain for its residents. In the last ten years these villagers have gone through a phase of industrialization and socioeconomic changes. To know the impact of quarrying and crushing on the water and farming, the villagers were asked about the increase or decrease in the quality and quantity of drinking water, water for irrigation, crop yield / hectare etc. in the last one decade. As per the interviews, mining and crushing operations have no negative impact on the quality and quantity of water, soil and air of the village.

However there is significant decrease in the number of buffalos, cows and goat etc. from 1992 onwards. This was attributed to the fact that before the mining started in the area, the mountain area provided the fodder of these animals. After the mining operations started, the villagers sold their animals to the extent of 90-95%. They invested this money in buying the trucks and dumpers to catch up with the new employment opportunity in the area. Thus there was a shift of traditional occupation and the income started rising. Many of the villagers invested in blasting operations too.

When the Supreme Court ordered the closure of mining operations in 2001, these villagers were forced down to stop functioning in the area. As they could not pay back the installments of the loan, their trucks / dumpers were mortgaged by the creditors. Around 200 trucks / dumpers are still standing idle in the village.

Most of the young people could be found staying at home during the day. This is becoming a stressful proposition as they found themselves in a situation where they are neither able to earn nor able to clear the debts. Also they can't go back to their traditional work of animal husbandry as buying new animals means a fresh investment of lakhs of rupees. Moreover the existing fodder is not sufficient even for the present animal population. The grazing fields were destroyed in the decade of mining operations.

It is worth mentioning that all the mining has to be carried out in accordance with the mining plan along with Environmental Management Plan (EMP), as approved by Bureau of Mines. The project authorities are responsible for scientific reclamation / rehabilitation of the mined out area. They are required to plant 500 plants per hectare as per the mining plan. In case of trees / plants removed during the mining activity, the project authorities need to plant minimum double number of such plants in addition to 500 plants per hectare. Also the inactive dumps should be covered under the plantation on as approved under EMP / Mining Plan. It further says that no tree is to be planted in the area where Forest Deptt. Has already undertaken the plantation and no credit for any such plantation will be given. As per para 3 of directions contained in the Supreme Court's order dated 10.05.1996 (page 60, Vol – A, Compilation of State of Haryana), Director, Mines and Geology and Haryana State Pollution Control Board have been made responsible to ensure compliance of various provisions of the Mining Plans. However, the following photographs of the mining area make it quite clear that no visible action as prescribed above has been taken by any responsible operator / authority.



Photo 1: Closed and discarded Mines at Pali. No sign of reclamation / rehabilitation even after two and a half years of closure.



Photo 2: Miles of fodder search.

### **The Crusher Environment**

There are approximately 250 units operational in the area. There are prescribed norms by the state government to be followed by these units. The Schedule -II of the Haryana Govt. Gaz. (Extra), Dec 18, 1997 (AGHN 27, 1919, SAKA) contains the directions regarding emission norms and pollution control measure requirements. According to this document, the suspended particulate matter shall not exceed 600  $\mu\text{g}$  per cubic meter, between 3 – 10 meters of any process equipment of a stone crushing unit. No reference range has been suggested for the respirable suspended particulate matter (RSPM) in the breathing zone of the worker in this document.

The pollution control measures to be taken by the crushing units are a) installation of dust containment cum suppressing system, b) construction of wind breaking walls, c) construction of metalled roads inside the unit or within the zone, d) regular cleaning and wetting of the ground, e) growing the green belt along the periphery of the crushing unit or the crushing zone, f) sprinkling of 10 kilo liters of water per day for a stone crushing capacity of 100 tonnes per day. It further prescribes that the green belt along any approved notified zone will be for a depth of at least 100 meters or along the periphery of the crushing zone with minimum 10 rows of such trees in the direction of the depth of the green belt. The nature of tree to be planted and their protection measures required shall be subjected to approval of the competent Divisional Forest Officer. The responsibility for planting and maintaining of green belt shall be with all the crushing units operating at that time. For each stone crushing unit sited within the approved crushing zone, a minimum of 150 trees planted all along the periphery of the premises of the crushing unit concerned will be provided and properly maintained by the crushing unit concerned individually apart from the green belt provided on the periphery of the crushing zone.

Its relevant to repeat that The Delhi Factories Rules 1950, under the Schedule XXVI describes manipulation of Stone or Any Other Materials Containing Free Silica. It further prescribes that No manipulation shall be carried out in a factory or part of a factory unless one or more of the following measures, namely: - a) damping the stone or other material being processed; b) providing water spray; c) enclosing the process; d) isolating the process; and e) providing localized exhaust ventilation are in place.

Visibly, none of the above parameters are being met. All through our journey to the village from the link road, we came across number of hoardings saying, "Greenery in the Zone is maintained by Pali-Mohabtabad Crusher Owner Association", but it was hard to find any human caring of natural shrubs and weeds that are growing in the area.



Photo 3: Barren Periphery of the Crushing Zone. Are you looking for a green belt?



Photo 4: Dust control device – just a lion cloth around head and face.



Photo 5: Dust – Dust just go away or we will ignore you.



Photo 6: What is a funnel or sprinkler? Dust is everywhere, why to control it here only?



Photo 7: All the prescribed norms are met with and are verified. How?

As though this is not an enough mockery of rules and regulations, the slum that has come up at the walking distance of the crusher units can tell us how the rule books are written and followed. The same gazette while prescribing the norms for siting the crushers in Haryana, states the minimum distance required from nearest village abadi is 1.0 Km and from the nearest town abadi is 1.5 km. Usually an average village have a population of around 1000 people. The startling fact is that the rules do are taking care of these 1000 people, but what about 15000 – 20000 people who have migrated from other states to work here and residing in this slum? Three to six people share a brick and mudroom with a roof of tin or straws. This all along with no water and electricity, no provisions for cooking and any other basic amenity of life. Defecation in open and stagnant rainwater are more than enough to blow up the disease outbreaks.



Photo 8: In search of livelihood, they are bound to die.



Photo 9: We live just a few meters away from where we work.

### **The Health Status:**

All is well that shows well. How many people are disabled or have died – there are no figures to comment upon. From where the workers have come, where they have gone, nobody knows. There is no registry system to record the incidences of injury / accidents at workplace.

According to a doctor practicing in the area, approximately 40% of the workers suffer from respiratory diseases. Most of them are diagnosed as having tuberculosis. A worker interviewed by us during the survey was having acute respiratory distress. He had been diagnosed as having pulmonary tuberculosis for which he was getting treatment from a private doctor. Although he was not getting the treatment for last one month as his doctor was away, he refused to accompany us to a govt. hospital. On enquiry on our next visit, we were told that he died in few days. There is no clue as to how many others suffer and die in the area like him. Whether their families, living far away know that the bread earner is alive or dead depends upon the awareness of fellow workers about his whereabouts. We found that they know very little about each other, like their address, even the name of the village from where he is, or about their families. It seems they know and have chosen their fate to work here and die anonymously. They are being used as another raw material in all this process of the product making for Country's growth, development and prosperity. It is worth mentioning here that these crushers had been shifted here after the Supreme Court's judgment with the intention to save the environment of Country's Capital. Nowhere does the judgment mention the safety and health of the workers. Which environment we are supposed to be saving at the cost of these people? Workers had died, are dying and will die in future due to apathy of all the responsible so called watchdogs of the environment minus their people. The Lalkuan has plenty of confirmed silicosis patients. And the workers in Pali, all in the age group of 20-30 can see their future in them.

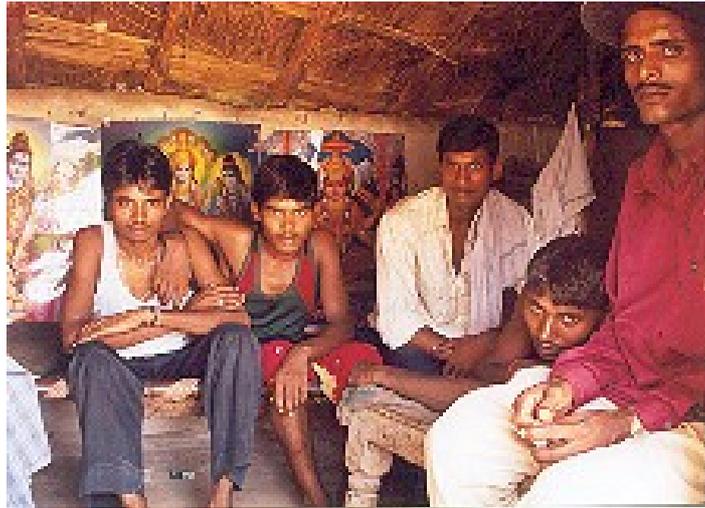


Photo 10: The present: young, happy and hopeful.

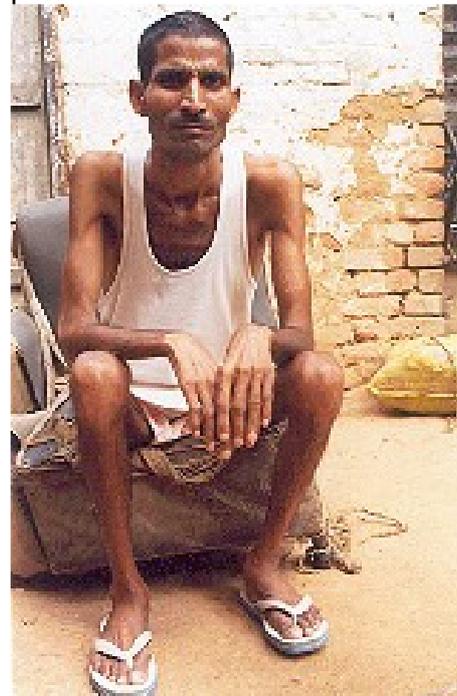


Photo 11,12: The Future: fragile, sad and hopeless.  
(These are the confirmed cases of Silicosis from the Lalkuan Area)

Not only the workers, but also their families who are residing close to these units are more vulnerable to the silica exposure. The children, the women and elderly all are breathing this toxin day and night. Malnourished children with already compromised immunity can cause acceleration of irreversible early changes in the disease pattern.

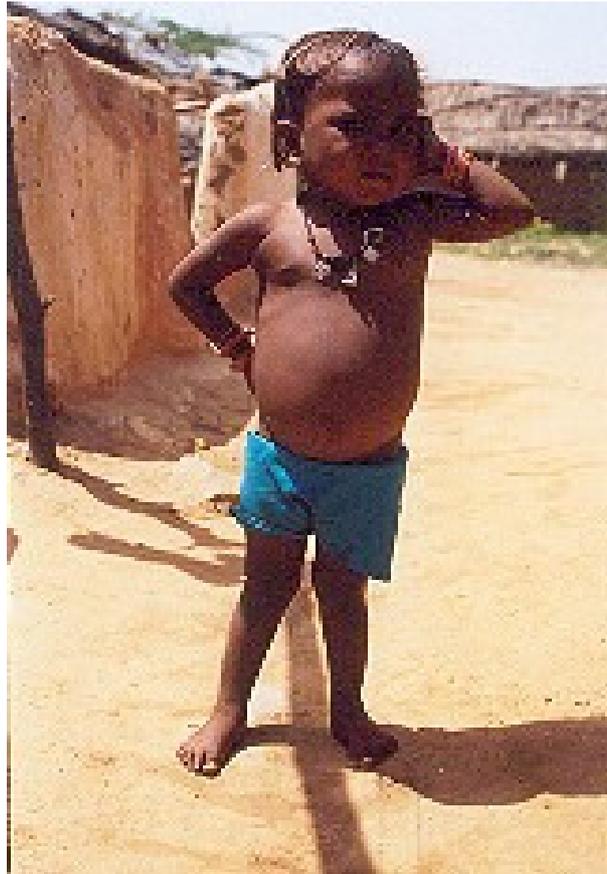


Photo 13: Will someone take care of me?

Irregular working hours, overwork and heavy manual labour is taking toll of the health of these workers. The outbreaks of infectious and communicable diseases are common because of availability of a perfect host, overcrowding and poor sanitation of the area.

### **The Safety Status**

No available document comments upon the safety of machine and human beings. Designs of machines are all open, without any guards and requires frequent maintenance by the human intervention. Moreover no personal protective equipment is being provided to the workers. Helmets, safety belts, masks, safety shoes are foreign things. It is alleged that approximately 200 had been buried alive during the mine blasting operation in the past decade only. Also the vehicular accidents at the mining area cause considerable morbidity and mortality. Its alleged that blasting is banned in the Aravalli range by a Supreme Court order but somehow the Apex court itself has been passing orders to operate in the area.

The high rate of morbidity and mortality is being compounded by high rate of workers turnover. After getting sick they go back to their native places where they either die or live a life of destitute.

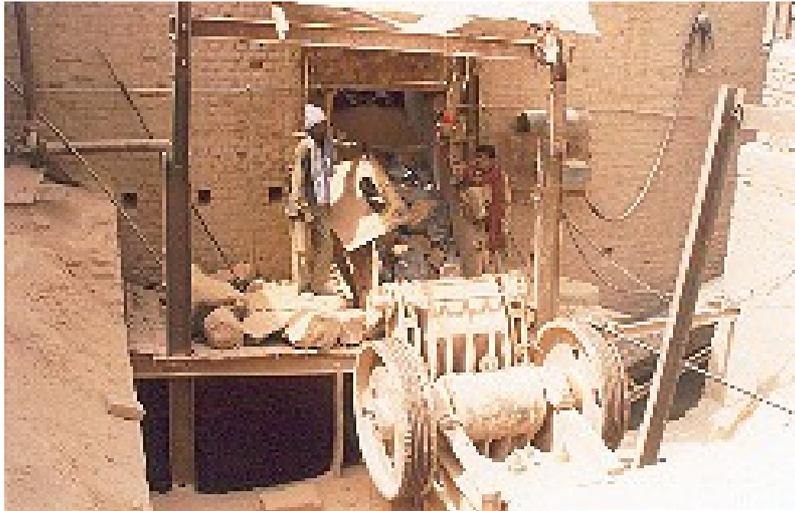


Photo 14: Invitation for a perfect suicide

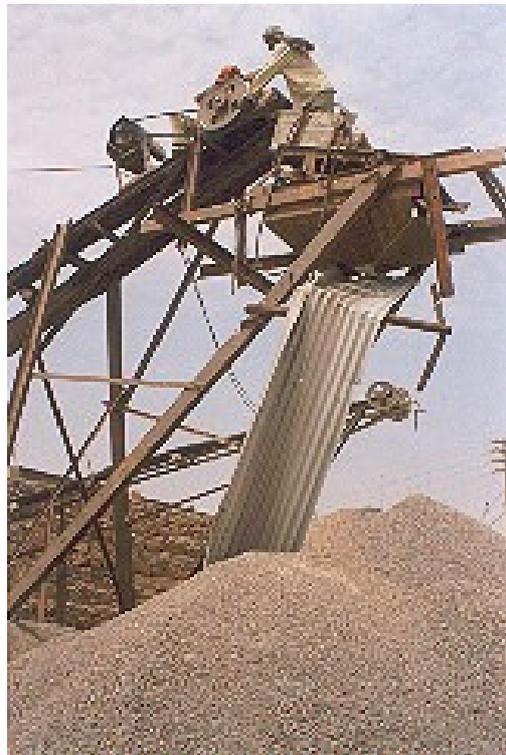


Photo 15: Let me repair it, or else the production will fall.

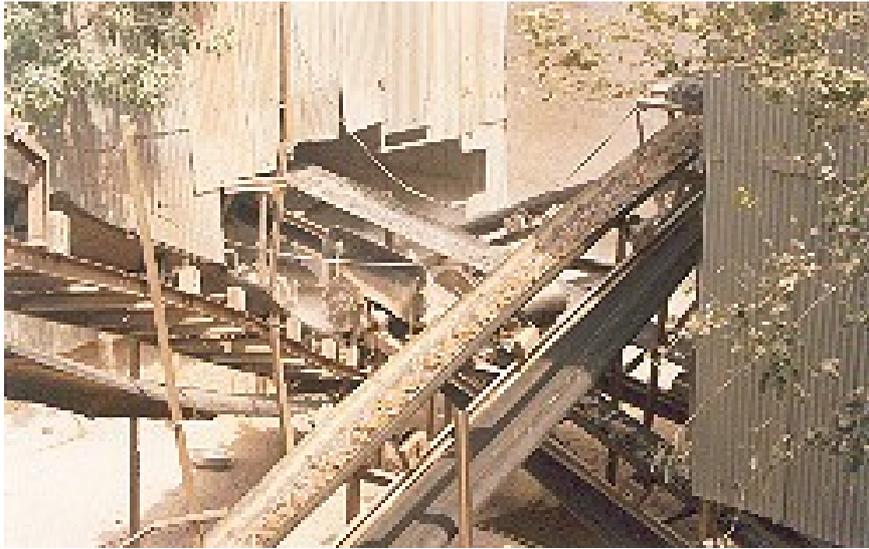


Photo 16: Environment, Pollution and Human existence at Criss-Cross.



Photo 17: Don't worry; we can take all the load of development on our head.

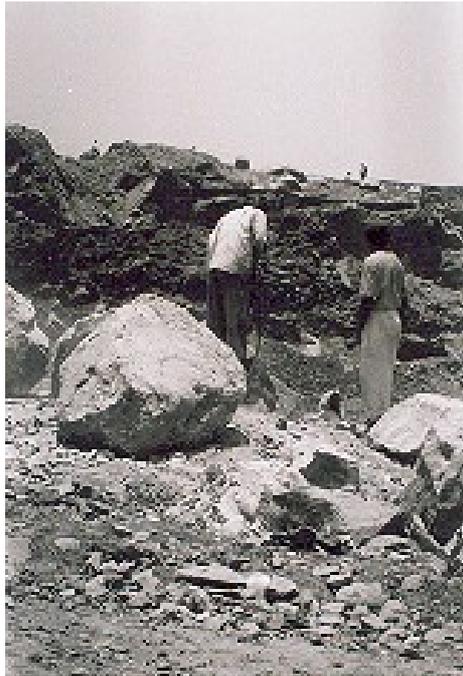


Photo 18: Please don't mind, blasting the mine can blast your mind /ears too.

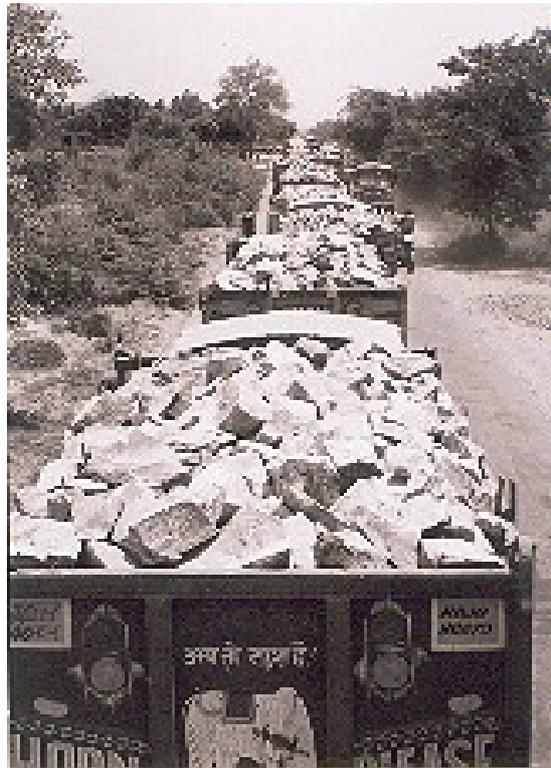


Photo 19: Country is on the road of progress.

## **Summary**

Shifting of a polluting industry can definitely help in improving the local environment. But one aspect of the environment that is constantly being ignored is the most important, human being and that too by the fellow homo- sapiens. It's evident from the Lalkuan from where the crushers have been shifted to Pali. Thousands of workers and their families have been affected, more than hundred people have died of Silicosis and many more are confirmed of the disease. The so-called bonded labour of the Lalkuan has been denied all the labour rights for several years. This same is bound to happen in the Pali and surrounding areas in the wake of above findings wherever the mining and crushing activities are going on. The negligence on the part of responsible and accountable authorities, sloppy law implementations and denial of human rights are creating another Lalkuan out of this peaceful hilly area.

It is tragic that the role of our own Apex court is questionable in this case. Why the quarry was permitted and later withdrawn? Is the court working on the whims of its worthy judges? It has become equivalent of a fly by night operator who establishes his lucrative business, ruins the locality of their belongings by promising good returns and flew away by the end of the day. Should we subscribe to all this with closed eyes? How an environmentalist for one area could act as an anti-environmentalist for the other area? How the human beings of one place have a privilege to better environment and health than their counterparts?

To ponder over the problem in more systematic and scientific way, we propose to do a pilot study of the issue. The relevant legal procedures, the industry requirements, the newer technologies, health and safety needs, training and education needs, the rehabilitation of industry and workers, role of governments, role of public and local populations, present health condition and comparison to the existing evidences etc., labour rights and human rights --- these all should be included in this pilot project so that a comprehensive outlook can be projected as far as this industry of quarrying and stone crushing is concerned with.

## **Annexure I**

### **LABOUR LAWS APPLICABLE TO QUARRY WORKERS**

A large number of labour laws exist to ensure and regulate employment, working conditions, wages, safety welfare, health, housing, bonus, social security, etc. of workers, Some of these of relevance since they apply to unorganized labour with is in exist tence at the stone quarries and stone crushers.

#### **Briefly these laws are:**

- (i) The Mines Act, 1952 read with the Metalliferous Mines Regulations, 1961, Mines Rules, 1955, and other Rules, regulates technical operations in the mines and ensures the safety, welfare and health of the mineworkers.
- (ii) The Factories Act, 1948, which along with Delhi Factories Rules, 1950, covers the stone-crusher workers.
- (iii) The Workmen's Compensation Act, 1023.
- (iv) The Contact Labour (Regulation and Abolition) Act, 1970.
- (v) The Inter State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979.
- (vi) The Bonded Labour System (Abolition) Act, 1976.
- (vii) The Employee's State Insurance Act, 1948.
- (viii) The Minimum Wages Act, 1948.
- (ix) The Payment of Wages Act, 1936.

## **Annexure II**

### **Bureau of Mines:**

Indian Bureau of Mines (IBM) was set up on 1st March, 1948. Initially IBM functioned purely as an advisory body. It helped government in framing various rules like Mines & Minerals (Regulation & Development) Act, 1948, Mineral Concession Rules, 1949 and Petroleum Concession Rules, 1949.

IBM was given a set of functions in 1950 and in accordance with it, the inspection of mines and mineral prospects became a regular activity.

By 1953 IBM was given an additional function of undertaking detailed exploration of mineral deposits. Among the minerals explored by IBM were Iron Ore, Limestone, Dolomite, Coal, Copper, Tungsten.

Later Mineral Conservation & Development Rules, 1955 and Mining Leases (Modification of Terms), 1956 were framed.

An ore-dressing laboratory was set up at Delhi in 1955.

With the passage of time the activities of IBM grew in depth and extent like Technical Consultancy and preparation of mineral maps leading to complete inventory of mineral resources. With its pool of mining engineers, geologists and ore dressing engineers it covered a wide variety of needs of the mining industry.

Various publications related to mining and mineral industries were brought out.

Offices were set up in the different parts of the country close to major mining centers.

In the last decade, with the change in the policy of Government, two very important activities were undertaken by IBM. The first being the processing and approval of mining plans and schemes of mining for all the mines in the country and second one being the implementation of rules for the protection of environment. IBM accepted this challenge and has been successful in promoting the awareness about protection of environment in the mines through the " Mines Environment & Conservation Week".

IBM also started imparting training to the industry personnel in the preparation of mining plans and also in the other fields.

Modern Mineral Processing Laboratory, Analytical Laboratory and Pilot Plants were set up at Nagpur, Ajmer and Bangalore.

IBM lost no time in realising the potential of information technology and entered into the agreement with BRGM of France in setting up " Mineral Resources Intelligence System " and " Technical Management Information System" in HQ and its 3 zonal & 12 regional offices.

In a nutshell, the IBM has been able to promote awareness amongst all sections of the mining industry, necessity and advantages of systematic mining and conservation of minerals and protection of environment. The results of its ore dressing investigations have formed the basis of new commercial beneficiation plants and thus enlarged the mineral resource base. The IBM's clientele seeking technical consultancy covers a wide spectrum of small and large mines and many public sector organisations. IBM has been able to provide useful information to the industry through its publications and has been recognised as the Mines and Minerals Data Bank of the country.

## **Annexure III**

### **Process in Quarrying**

The notations used are as follows:

1. The topsoil is removed manually by 'beldars' (unskilled workers). It is carried in baskets (by women at times) and thrown at a certain distance. Some of it is loaded along with the stones that are sent to crushers. After this the stone is quarried, sometimes with the aid of blasting.
2. A slit or a hole is located in the rock. An iron rod-'gadali' 4-5 feet long and one inch in diameter, with one end flattened, is inserted into the slit. 3-4 labourers then press the 'gadali' downward as a lever, to displace the rock. This dislocates the rock substantially and brings it down on to the floor of the pit. If the rocks cannot be so dislocated, then they are blasted.
3. Holes are drilled to blast the big rocks. This is done by drillers who are employed by the owner of drilling machines, mainly residing in Rangpuri and Rajokri village.
4. Packing and blasting are done by the Khandar himself. The hole is packed with a urea-mixture, into which the 'topi' is inserted. One end of the detonator wire is inserted into the 'topi', the exposed end is ignited by the Khandar to initiate blasting.
- 5&6. Manual breaking of the rocks to smaller stones is done with hammers called 'jhumri', weighing about 12-20 kgs., the by Khandars. The stones so produced are usually termed 'soling' or 'moti patthar'.
7. The loaders, who come along with truck, carry the 'solng' on their heads, and throw them into the truck, to be transported to the crushers.
8. Some of the 'soling' are broken into 'rodis' in the quarry itself, by women or men who are not strong enough to do Khandari.

What actually happens is that the Khandar hires some beldars (at least two), for 2-3 days at a time and gets the rocks over a large area exposed. He then hires drillers, to drill a number of holes, varying in depth from 2-3 feet to more. The positioning and depth of these holes depend upon the size and position of the boulders to be dislodged. Then some of these holes are packed and blasted simultaneously. Once the rocks have been loosened thus, the Khandars work on them. The stones so produced-'soling' and 'rodis'-usually amount to more than one truck-load.

Tasks such as determining where and how deep the holes are to be drilled, from what position the rocks are to be loosened, require the judgment and skills of the Khandar, which are developed and acquired over a period of time. Any mistake could mean defective blasting, or injuries/death to the Khandar and his fellow-workers. Also, wielding the heavy hammers to break the stones is an extremely strenuous job. Requiring considerable strength.

## **Annexure IV**

### **Processes in Crushing**

The stones are obtained from the surrounding quarries.

1. One or two beldars stand on a platform. Their job is to pull down the stones from the pit with a wooden staff and ensure that there is a smooth ho into the crusher.
2. There is a pit below crusher-1. One beldar stands here to collect and throw up the stones that fall from the crusher-2 into the belt.
3. A beldar stands here to put back stones falling from the belt coming from crusher-2.
4. One beldar stands near crusher-2 see that it works properly.
5. Labourers stand near the heaps of crushed material, smoothening out the heaps loading into trucks, etc.

## Annexure V:

### WAGES AND WORKING CONDITIONS AND TERMS OF EMPLOYMENT

#### Earnings and Working Hours in the Quarries

Different categories of workers have different wages and working hours. The following summary describes each category briefly and gives its nature of work.

**1. Khandar:** The Khandar has no fixed hours of work. He works for about 10 hours a day, sometimes more. Prior to starting his own work, which entails extraction of stones, and breaking them into 'soling', he makes a host of preparations for other operation. These are:

- (a) Gets topsoil removed by Beldars: It takes 1-2 days and costs approximately Rs. 80/day.
- (b) Gets holes drilled for blasting: the khandar pays Rs. 20 per foot of hole drilled to the drilling machine owner. For example a 5-foot hole costs him Rs. 100.

(c) Arranges blasting material: It is available only at a premium at different places at different times, due to the illegal nature of the whole business. Approximate cost of this material is Rs. 20 per kilo of mixture, Rs. 7 per topi and Rs. 25 for one fuse of 12 feet.

After making these preparations he himself works for 2 to 3 days, for 8 to 10 hours each day, to extract the stones. If all goes well, he loads 5 to 6 trucks. The khandar gets paid for 150 cubic feet of stone, whereas they actually load more than that, about 180 cubic feet per truck.

The 'rodies' and 'soling' fetch different prices. The crusher-owners are major buyers of 'soling'. For every truck they pay Rs. 900 to the thekedar/supplier. Of this the thekedar keeps Rs. 600 as his commission and gives the rest to the khandars. So for every load 'soling', the khandars get Rs. 300. They also have to pay Rs. 1/sq. feet to labour loading the truck.

Discussions with numerous khandars indicate that the expenses incurred per truck varies considerably. For instance four khandars who had produced 20 trucks in a fortnight had incurred the following expenses:

300 feet of holes drilled	6000.00
84 'topis' for 84 holes	588.00
14 fuse-wires	350.00
35 Kgs. Of explosive mixture	700.00
Mechanical Removal of topsoil (Rs. 800/hr)	2000.00
Miscellaneous	1500.00

Total

**11138.00**

Payments are made per truckload. Payment schedules vary from 7 to 15 days depending upon the length of the work cycle. The number of truck-loads generated varies considerably due to the following factor:

- (a) The quality of the pit that the khandar is working in.
- (b) Availability of material for blasting.
- (c) The positioning of the holes, which may not always be right, or the blast may not be powerful enough to have the desired effect. Hence after blasting it is possible that nothing or very little may be achieved.
- (d) The most important factor is the capacity of the khandars to work. Wielding the heavy hammers to break the stones requires considerable strength. The khandar also has to run ground, this also requires considerable strength. The khandar also has to run around to procure the explosives, etc. Further, because of the conditions in which the khandars work and live, they are frequently incapacitated by injuries and illnesses, which weaken them considerably and drastically reduce their capacity to work.

Therefore a number of factors have to be “favorable” for the khandar to be able to work consistently and produce sufficient truck-loads, so as to have a reasonable net income. Only those khandars who are healthy and can make an out lay for operations on a large scale are able to do so.

## **2. Beldars (those who remove the top soil)**

The beldars are time-rated and paid by the khandar. Since they are hired through a jamadar, the latter takes Rs. 8 out of Rs. 60 that the khandar pays for about 6 hours of work to the beldar.

## **3. Drillers**

The drillers and the tractor-driver are paid a sum varying between Rs. 3000 to 3500 per month by the owner of the tractor and drilling machine.

Along the workers who break the ‘soling’ to ‘rodies’ the majority are women. Two women together produce about one truck in two days time. They earn Rs. 280 for this work. This works out to approximately Rs. 70 per woman worker per day. The women-members of about half the families work, thus adding to the family income.

## **Other employment conditions at quarries**

- (a) There are no paid holidays, medical allowance, travel allowance, ESI benefits, overtime allowance, provident fund, pension etc. as stipulated in the labour welfare laws.

- (b) There are no record and registers of amount of work done.
- (c) At the work site there are no drinking water facilities, rest rooms, toilets, canteens, first aid facilities and crèches.
- (d) The workers learn the work themselves, on the job with the help of fellow workers.
- (e) The khandars usually live with their families in jhuggies, close to the pits. The beldars live in rented rooms in village; their families do not stay with them. No accommodation is normally provided by the contractors.

### **Hours of Work and Wages in Crushers**

Though in practise there are no fixed hours of work as the work depends on the demand, condition of the machine and electricity supply, however all machines run for more than 10-12 hrs. from 6 a.m. to 6 p.m., with a 2-hour lunch break. Therefore a beldar, oilman or mistry, munsif and truck driver work for at least 8 to 10 hours a day. They are paid on a monthly basis as following:

Beldar on crusher	Rs. 1800 to 2000
Oilman or mistry	Rs. 2500 to 2800

Mechanical Loader is employed to load the trucks. The full and final payment is made when the worker leaves for home, after deducting advances taken for emergencies such as accidents, injuries and ill health, etc.

### **Other employment conditions at crushers**

- (a) There are no paid holidays, medical allowance, travel allowance, ESI benefits, overtime allowance, provident fund, pension etc., as stipulated in the laws.
- (b) There are no proper records or registers. We were repeatedly told that the crusher owners maintain 'double registers', one for their day to day work and the other for the record of the administration and labour inspectors.
- (c) At the work site, there are no drinking water facilities, rest rooms, toilets, canteens and first aid facilities.
- (d) The workers learn the job themselves with the help of fellow workers.
- (e) The employers have provided no accommodation. The workers live in the vicinity of the crushers in 'quarters' rented out by the local villagers.

Sometimes the workers avail a loan from the owners at very high interest rates and thus have to work for longer period for repayment of this loan. This is true for both the mining as well as crusher workers.

Also there are no facilities of school, electricity, drinking water, health facilities for the workers in the both the areas.

